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RESEARCH ARTICLE

Boardroom gender diversity and dividend payout strategies: Effects of mergers deals

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Abstract

Our study examines the effects of mergers and acquisitions deals on the relationship between female leadership and dividend strategies for 90 UK listed firms during the period 2006–2016. Results indicate that firms with a larger proportion of female directors serving on the board are more likely to pay higher dividends, but this positive finding is weaker when the firms experienced a higher number of mergers and acquisitions deals. Interestingly, extended analyses on female directors' positions show the opposing effects of female Chairmen and female CEOs on a firm's payout strategies. Although a female Chairman is associated with higher dividend payout levels, a female CEO shows an adverse impact. Yet these results tend to be reversed for firms with more merger and acquisition transactions. Our findings make a significant contribution to a trendy but relatively limited and inconclusive topic that links gender diversity to scrutiny intensity.

KEYWORDS

board gender diversity, dividend payouts, female directors, FTSE100

JEL CLASSIFICATION

C23; G01; G21; G28; L50; M41

1 | INTRODUCTION

Despite the acknowledgement made by UK industrial firms that board gender diversity (i.e., the existence of females on boards of directors) is an imperative factor contributing to effective corporate governance mechanisms and in turn, corporate dividend policies, prior literature appears to be silent about how this is so (Trinh, Pham, Pham, & Nguyen, 2018). Indeed, UK corporate governance code (2016) presents: 'the problems arising from "groupthink" have been exposed in particular as a result of the financial crisis. One of the ways in which constructive debate can be encouraged is through havinsg sufficient diversity on the board. This includes, but is not limited to, gender and race'. In addition, the UK governance has set a goal that women should hold at least a third of UK boardroom positions by the end of 2020. Such an aim for gender 'balance' is close to its realization as the proportion of women on board FTSE350 companies has significantly increased from just 9% in 2010 to more than 30% in 2019 (Pooley, 2019). Whilst regulators and corporate practitioners have increasingly supported the value-add of females within the board, similar recognition has not been shown for females to hold the most senior positions in corporations, for example, female Chairmen and CEOs due to their current under-representation (Pooley, 2019). This

raises the question as to whether females on the board and females representing senior roles have any influence on corporate financial decisions, in this study particularly, on dividend decisions of UK FTSE firms.

Empirical reflections on the impact of gender-diverse boards on dividend payment policies are relatively negligible and inconclusive, especially in the UK context. Three exceptional and typical studies in this field are from Chen, Leung, and Goergen (2017) and Byoun, Chang, and Kim (2016), both of which explore a significant positive linkage between female directors and US corporate dividend policy, and from Elmagrhi et al. (2017) that support the negative relationship between board gender composition and the level of dividend payout amongst small and medium-sized enterprises in the United Kingdom. Despite different female-dividend relationships being obtained, both findings support the positive value-added contribution of female directors on the board in enhancing the firms' decision-making and monitoring process. Specifically, the positive female-dividend association is justified based on a preference for using dividends as a means of reducing free cash flow, and hence agency problems, by female directors. Conversely, in the case of the growing business environment, for example, emerging market (Saeed & Sameer, 2017), or small- and medium-sized firms (Elmagrhi et al., 2017), where firms remain exposed to potentially profitable investments, female directors will informedly, rationally, and professionally capture the opportunities. As a result, they are likely to use 'internal funds' to finance investments instead of paying dividends.

Consequently, our study adds to the literature by freshly examining the relationship between board gender diversity and dividend payout decisions in the context of UK large companies (FTSE 100). This approach is different to the study of Elmagrhi et al. (2017), whose sample was comprised of small and medium-sized UK firms, we expect the opposite finding, that is, a positive relationship between female leadership and dividend payouts because dividend payments may be a more optimal option for dealing with free cash-flow for mature firms, where profitable investments become relatively limited.

To this end, the contributions of this research are three-fold. First, our article complementarily adds to the existing UK studies regarding gender-diversified boards (e.g., Elmagrhi et al., 2017) by investigating whether UK large FTSE100 firms with gender-diverse boards adopt different dividend payout policies vis-à-vis those with nongender-diverse boards. It is also interesting to explore the findings for UK firms that may be dissimilar to those for US counterparts found in prior studies because they are different in terms of board structure, duality, and governance. Particularly, for UK firms, there is the separation of the roles of board Chairman and CEO, whereas the majority of US firms have combined board Chair/CEO.[1] Another key point that makes a difference in the board structure between these two countries is the length of time that directors are permitted to serve continuously on boards. In the United Kingdom, the maximum permitted term of service for a director is an average of 9 years; if they want to extend the period, the firm must explain how the director's independence has not been compromised by the extent of their commitment. In the United States, however, there is a marked reluctance to set the limitation for a term of service. Several firms have put efforts into setting term limits in place, but generally, the length of tenure seems not to be considered as an issue. Furthermore, there is some variation regarding institutional settings such as regulation, tax rules, and competition between them. For example, there are differences between the US and UK governance systems related to the number of firms quoted in each stock exchange and differences in the categories of shareholders (Faccio & Lasfer, 2000). Brockman and Unlu (2009) state, in an analysis of 52 countries, that the typical UK firm is 87% more likely to be a dividend-paying firm than its US counterpart. In addition, the typical UK firm paid almost 2.80 times more dividends (as a percentage of sales) than its US peers. Therefore, the need to test an empirical hypothesis in a more regulated market with strong practices of paying out dividends such as the United Kingdom could yield different and interesting results.

Second, following the above differences between the United States and United Kingdom in term of board duality, together with the aim of clarifying the value contribution of females holding top senior positions within organizations, we also conduct in-depth analyses on female Chairmen and female CEOs to examine the dividend payout policies of female-led firms. With the different powers and responsibilities in making the ultimate decisions, we expect that firms that appoint female Chairmen and female CEOs may employ dissimilar dividend payout strategies.

Third, we bring into the picture the effects of mergers and acquisitions (M&A) as a moderating factor influencing the relationship between female leadership and dividend strategies. It is worth noting that instead of focusing on the relationship between female directors and M&A, we propose M&A as an important background setting for the female-dividend association due to its influences on firms' financing options. Specifically, as M&A is a potential value-enhancing investment, its financing method, that is, cash, debt or equity, is an important decision to be made. As females tend to be more risk-averse, more conservative, and less competitive than their male

counterparts (Byrnes, Miller, & Schafer, 1999; Croson & Gneezy, 2009; Parrotta & Smith, 2013), they are more likely to use the internal resources (cash) to fund the M&A investment, leaving less cash available for dividend payout. This argument leads to our following question: Do M&A deals affect the relationship between gender diversity and dividend payout policy?

Using a comprehensive panel sample of 90 listed non-financial firms traded on the London Stock Exchange FTSE100 for the period of 2006–2016, we find that cash dividend payouts are positively associated with the presence of female directors serving on boards of directors. This implies that greater board gender diversity can diminish agency conflicts between shareholders and managers, which encourages (or, forces) the latter to pursue a higher cash payout policy. As expected, in a developed business context (large and mature UK firms), the finding is different from that obtained on small and medium firms in the study of Elmagrhi et al. (2017). Intriguingly, our additional analysis further highlights the opposing effects of the gender of different positions (i.e., Chairman and CEO) on firm payouts. Although a female Chairman is more likely to mitigate the agency conflicts within firms, and in turn, is related to higher levels of dividend payouts, a female CEO shows an adverse influence. This result can be justified by different characteristics, roles, and power of the Chairman in comparison to the CEO. A female Chairman seems to be a good candidate for overseeing and monitoring the firm, whereas a female holding the top executive positions tend to be more aggressive in decision making. Lastly, we find that M&A deals play a moderating role on the relationship between female leadership and dividend policy. That is, a higher number of M&A deals is likely to mitigate the positive effect of gender diversity on dividend payouts. In addition, M&A deals have also reduced the positive and negative effects of female Chairmen and female CEOs, respectively. This further justifies for the conservative nature of female Chairmen as a responsible agent in overseeing and monitoring companies whilst emphasizes on the more aggressive nature of female CEO as an executive agent within firms.

Our article has several valuable practical implications. First, larger firms should be aware of the potential benefits of employing female directors in controlling their dividend policy. This finding can be integrated with the previous finding on UK small- and medium-sized firms showing a negative result, to offer UK firms a fuller picture on the gender diversity-dividend payment nexus. Second, we have highlighted opposing effects on financial decisions between the female Chair and the female CEO, so UK firms should also consider the gender factor when appointing top senior positions. Finally, M&A may be an important event, which potentially alters the single effects of female leadership on the board, so firms also need to take this factor into account for their decisions.

Section 2 describes the research background and hypotheses development. Section 3 presents the data and variable definitions. Sections 4 and 5 report summary statistics and empirical findings/analysis, respectively. Section 6 provides some sensitivity and robustness to the results. Section 7 concludes the research.

2 | RESEARCH BACKGROUND AND HYPOTHESES DEVELOPMENT

Literature has documented several empirical studies (e.g., Adams & Ferreira, 2009; Ahern & Dittmar, 2012; Carter, D'Souza, Simkins, & Simpson, 2010; Faccio, Marchica, & Mura, 2016; Kanadlı, Torchia, & Gabaldon, 2018; Matsa & Miller, 2013) with evidence of the influence of board gender diversity on firm performance, risk-taking and market value. These studies have argued that gender-diverse boards are more effective monitors over a board's strategic decision making because female directors provide unique information to the board and thereby, contribute to a better understanding of the complexities of the environment, a reduced risk of 'group thinking' and more astute decisions. In addition, female directors tend to attend board meetings more than their male counterparts (Adams & Ferreira, 2009), and the presence of a female on the board can enhance the discussions on complex decision problems (Gul, Srinidhi, & Ng, 2011; Miller & del Carmen Triana, 2009). However, gender-diverse board members with different backgrounds and skills may have some integration problems, and thus, can negatively influence a firm' financial policies. For example, people, such as female directors, who are different from their peers, are also more likely to be isolated. Baysinger and Butler (1985) and Adams and Ferreira (2009) criticism is that many firms tend to recruit female directors merely as tokenism as having a gender-diverse boards can be legitimate to the public, the media, and the government. Such ongoing debate over directors' gender calls for further research on its influences on different outcomes of firms and their financial policies.

2.1 | Gender diversity and dividend payout strategy

A board of directors is regarded as a source of information that helps shareholders monitor the opportunism of

managers (Fama & Jensen, 1983). It plays a vital role in controlling managers' decisions to ensure that these managers offer their useful resources to their firm and, ultimately, maximizing the shareholders' values (Mülbert, 2010). Core, Guay, and Rusticus (2006) indicate that weak corporate governance tends to generate high agency costs, and hence, negatively influences firm performance; and the board is established as a key device to diminish the conflicts between owners and agents and enhance monitoring of management.

Amongst many compositions of an effective board of directors, agency theorists argue that the presence of female directors on boards can strengthen monitoring mechanisms on executives (Carter et al., 2010). They presume that female board representation is likely to increase board independence and improve its monitoring effectiveness as well as corporate information. Hillman and Dalziel (2003) support this argument by stating that a more heterogeneous boardroom serves as a superior mechanism since a wide range of perspectives and views might improve the board decision-making effectiveness. Therefore, a more gender-diverse board should allow firms to mitigate agency problems and thereby increase governance quality.

Supporting the argument that female directors reduce agency problems, several studies suggested that a board with a higher representation of females tends to employ the 'dividend' tool to achieve such a monitoring mission. The finding holds for companies in Jordan (Al-Rahahleh, 2017), Spain (Pucheta-Martínez & Bel-Oms, 2016), and the United States (Byoun et al., 2016; Chen et al., 2017). This is primarily because dividends are viewed, according to the agency theory (Jensen, 1986), as one of the most effective mechanisms for mitigating agency problems/conflicts between the principal (shareholders) and the agent (managers) through reducing free cash flow which can be ineffectively used by managers (DeAngelo, DeAngelo, & Stulz, 2006). Therefore, they are more likely to employ 'dividend' cash payout as an effective monitoring tool to prevent managers from exploiting discretionary funds.

Another rationale explaining this positive association between female and dividend strategy is based on the differences in behavioural cognition across gender, together with the 'bird in the hand' dividend-relevance school of Gordon (1960) and Lintner (1962). There are a huge number of studies examining the differences between men and women's behaviour, which contributes to differences in decision-making and the governance practices of male and female directors. Conversely, cognitive psychology and management studies suggest that women tend to be more conservative and have a stronger aversion to risk than their male counterparts (Byrnes et al., 1999; Parrotta & Smith, 2013). Similarly, Croson and Gneezy (2009) found that gender differences can be illustrated through social preferences, risk attitudes, and reaction to competition. For instance, female individuals seem to be higher risk-averse and less competitive than male counterparts, and the social preferences of females are more malleable than those of males. In line with this argument, Al-Rahahleh (2017) found evidence that the differences in the behaviour of women and men lead to multifaceted decisions in the boardroom, which may positively contribute, to the firm's improvement. He also shows that women are likely to take lower risks than men, which leads them to make less aggressive policy choices and accept more sustainable investments. Such findings are in line with the conclusion of Chen et al. (2017), which also documents that women prefers engaging in lower risky projects.

Firms' free cash flow can either be reinvested or distributed in the form of dividend payout. Amongst the two, dividend payout is deemed to be the less risky option due to the 'instant' cash receipts whilst returns on the reinvestments are realized in the future and unavoidably subject to risk. Therefore, with the more risk-averse, more conservative, and less competitive natures of female directors in comparison to their male counterparts, they are more likely to distribute more dividends to shareholders.

On the contrary side, studies of Elmagrhi et al. (2017) conducted on small and medium-sized UK companies and Saeed and Sameer (2017) conducted in emerging countries including India, China, and Russia, reported opposite findings, that is, a negative relationship between female presence and dividend payouts. To justify this finding, the authors focus on the complementary perspectives and professional experiences provided by female directors (Hillman, Shropshire, & Cannella Jr, 2007 and Ward & Forker, 2017). In particular, corporate boardrooms which have women are more informative, organized, and timely (Gul et al., 2011). Female directors also provide the board with valuable knowledge and expertise to formulate and assess strategic decisions (Chen, Crossland, & Huang, 2016). This can help the boards enhance their decision making on operational control tasks in terms of the responsibilities to monitor managerial decisions including dividends, cash flow, and investment and so on. Given this, in the context of small and medium-sized UK companies and emerging markets, a gender diversified board may possess more informed information about potential profitable investments. Therefore, they tend to take strategic action to 'preserve internal funds for investment' rather than cashing out for dividends (Conyon & He, 2017; Saeed & Sameer, 2017, pp. 1103).

Adding to the literature, our study is the first to investigate the gender diversity and dividend payout topic in the context of large UK firms using the FTSE100 sample. Based on the rationales provided for the two contradictory findings on the female-dividend relationship, we expect a positive relationship between female representation and dividend payout as contradicted to the findings obtained by Elmagrhi et al. (2017) in their study on small and medium-sized UK companies. First of all, it is acknowledged that dividend payout decisions are relatively more relevant and critical for large firms. According to the life cycle theory of dividend, mature, and established firms are more likely to pay and pay higher dividends as they tend to be 'older, more stable, and highly profitable' but with less attractive investment opportunities than younger and small firms (Bulan & Yan, 2010, pp. 179; and DeAngelo et al., 2006). Some studies, including DeAngelo et al. (2006), Fama and French (2001), and Grullon, Michaely, and Swaminathan (2002), justify this finding based on the trade-off between retention and distribution. Specifically, large firms tend to exhibit higher levels of free cash flow, leading to higher agency cost. As a result, it is argued that higher dividend payout is optimal for these firms. Conversely, small and medium firms 'face relatively abundant investment opportunities with limited resources so that retention dominates distribution' (DeAngelo et al., 2006, p. 228). Therefore, high dividend payout for these firms may not be appropriate. As a result, the following hypothesis will be tested:

Hypothesis 1 . *There is a significantly positive relationship between board gender diversity and the levels of dividend payouts.*

2.2 | Moderating effects of M&A on gender diversity and dividend payout strategy

M&A are one of the largest forms of corporate investment, which intensify the agency conflicts between managers and shareholders of large firms (Jensen & Meckling, 1976). Managers can take advantages of M&A activities for their own benefits at the expense of owners through a value-destroying M&A (Masulis, Wang, & Xie, 2007). According to the free cash-flow hypothesis (Jensen, 1986), firms with high levels of free cash-flow are more likely to be exposed to such suboptimal M&A activities. As a result, one way for firms to overcome such agency conflicts that might occur through M&A is to establish strong corporate governance.

The literature has reported that firms employing more female directors can improve the quality of the firms' M&A investment. Particularly, firms that engage in M&A activities with the aim of taking advantage of potential synergies and hence, increasing the firms' values. Nevertheless, without sufficient due diligence in the evaluation process, for example, managers are overlooked and overconfident (Hayward & Hambrick, 1997 and Puranam, Powell, & Singh, 2006), M&A can destroy firms' values. However, firms with female representation on the board of directors may assist in avoiding these value-destroying M&A. Female directors, in particular, are usually more vocal and less conformist (Adams, Gray, & Nowland, 2011) and tend to have greater sensitivity and caring nature than their male counterparts (Bradshaw & Wicks, 2000), which contributes to the change in the board dynamics and board actions (Miller & del Carmen Triana, 2009). Moreover, prior literature (Gul et al., 2011; Kim & Starks, 2016; Terjesen, Sealy, & Singh, 2009) argues that female directors tend to shape more independent thinking, increase board attendance, have better communication skills, and make more informed decisions, which helps them provide better control for organizational management and monitoring CEOs' and managers' activities more effectively than their male counterparts. Therefore, based on the arguments that a female presence on board is associated with the increased comprehensiveness of intra-board discussions with rationality and informed knowledge and active oversight, the level of M&A activities is lower (less M&A and lower M&A values) in female-led firms (e.g., Chen et al., 2016; Dowling & Aribi, 2013; Levi, Li, & Zhang, 2014).

In this article, the focus is moved away from the relationship between female directors and M&A. Instead, we propose M&A as an important background setting for the female-dividend association due to its influences on firms' financing options. When firms identify their acquisition targets, managers are required to make a decision on financing methods, for example, cash, debt, or new stock issuance. As mentioned, in the context of large firms, free cash-flow level tends to be higher than firms of smaller sizes. Hence, firms are exposed to financing choices of whether to use the available internal resources (i.e., cash) for dividend payment or M&A. Unlike other daily operating decisions, M&A per se and the financing decision for M&A are associated with intense board-level discussion amongst directors (male and female) and requires ultimate approval from the top senior layer of the firms (Levi et al., 2014). With the higher risk aversion level, female directors may opt to finance M&A by cash as this is the least risky option in comparison to the external resources (debt and equity), according to the Peking Order Theory (Donaldson, 1961). As a result, the cash resource availability will be reduced for dividend payment. Consequently, it is possible that M&A can

moderate the level of dividend payout by female directors. Consequently, the following hypothesis will be tested:

Hypothesis 2 . *There is a significantly negative moderating influence of merger and acquisition on the relationship between board gender diversity and the levels of dividend payouts.*

3 | DATA AND VARIABLE DEFINITIONS

3.1 | Data and sample

Our dataset covers 11 years from 2006 to 2016. The firm-level data include FTSE 100 constituents over the estimated time with yearly updating of constituent lists. Our database includes two major categories. The *first* category is *corporate governance* data, which consist of the number of female directors, gender of the Chairman and CEO, the number of nonexecutive independent directors, the total number of directors on boards, institutional and insider ownership. Those board-level data were obtained from FAME database and the female FTSE reports of Dr. Val Singh and Professor Susan Vinnicombe published by Crandfiled University. Hand-collected data from annual reports of individual firm website were also used for cross-referencing purposes. The *second* category, that is, data on dividends and other accounting variables (i.e., total assets, net income, firm age, financial leverage, Tobin's q, return on assets and return volatility) are compiled from DataStream and firm financial statements. M&A database for sample firms is retrieved from Bureau van Dijk's FAME. Any deals of M&A, which even were not successfully completed, are still included in the main tests since the board of directors has approved proceeding with the deal that is indicative of the board risk attitudes. These are in line with the study of Dowling and Aribi (2013). Financial companies are excluded from the sample (see Chen et al., 2017), because these companies have different and specific accounting, operating, and regulatory requirements compared with nonfinancial firms. Only firms with three consecutive year data availability were kept. The final sample includes an unbalanced panel of 90 nonfinancial firms or 700 firm-year observations.

3.2 | Empirical models and variable measures

In terms of model specification, the independent and dependent variables are the board gender diversity and dividend payment, respectively. Following prior literature (e.g., Chen et al., 2017), we utilize a number of control factors, which can potentially determine dividend payment decisions. Specifically, we estimate the baseline empirical model as below.

$$\text{Dividend}_{i,t} = \alpha_1 + \beta_1 * \text{BGD}_{i,t} + \beta_2 * \text{Female Chair}_{i,t} + \beta_3 * \text{Female CEO}_{i,t} + \mu_1 * Z + \text{Year dummies} + \varepsilon$$

where, $\text{Dividend}_{i,t}$ is dividend payment, measured by cash dividend over net income (Chen et al., 2017). $\text{BGD}_{i,t}$ is boardroom gender diversity, estimated by two alternative proxies including the number of female directors on board (Byoun et al., 2016), and the fraction of female directors on board (Chen et al., 2017). $\text{Female Chair}_{i,t}$ and $\text{Female CEO}_{i,t}$ represent for female Chairman (i.e., dummy variable which takes a value of 1 if the Chair is female and otherwise 0) and female CEO (i.e., dummy variable which takes a value of 1 if the CEO is female and otherwise 0), respectively.

Z includes control factors that may have significant influences on dividend payouts policy, such as firm characteristics (Harford, Mansi, & Maxwell, 2008; Leary & Michaely, 2011) and managerial entrenchment (Hu & Kumar, 2004). More specifically, we first include M&A variable that is measured by the number of M&A made within a fiscal year (see Chen et al., 2016; Levi et al., 2014) in the natural logarithm form. This variable is interacted with main variables of interest such as board gender diversity, female Chairman, and female CEO to examine whether M&A deals affect the relationship between these variables and dividend payout policy. We also include factors related firm-level characteristics, which are firm size, firm age, leverage, and Tobin's q, return on assets and return volatility. Firm size (Ln[Total Assets]) is defined as the natural logarithm of total assets. Redding (1997) suggests that firm size can help explain why companies pay dividends. Furthermore, Khoury and Maladjian (2014) indicate that large firms distribute high dividends as they are more competitive and tend to appeal more investors. Consequently, it is predicted that large firms have a greater tendency to pay high dividends. Firm age is computed as the natural logarithm of the firms' age that changes annually. Leverage is measured by total debt over total assets. Tobin's q is used to measure the firm growth opportunities, measured by total debt plus market capitalization that is defined as the value of a firm on the stock market divided by total assets. Literature shows that firms with high growth opportunities tend to pay lower amount of dividends compared to those with less growth opportunities. Return on assets (ROA) is a proxy for profitability, computed by

the net income over total assets. It is predicted that profitable companies can impose higher level of dividends (Aivazian, Booth, & Cleary, 2003). Finally, return volatility is a measure for business conditions, computed as the standard deviation of return on assets. According to Fama and French (2001), the higher the return volatility, the less likely companies pay dividends.

Control factors also include variables of managerial entrenchment that accounts for the impacts of board characteristics on dividend payment. Board size is estimated by the total number of directors on board. Academic literature argues that larger boards tend to be better in monitoring and supervising the opportunism of management, which allows them to mitigate agency problems and increase dividend distribution. Additionally, empirical studies (e.g., Litai, Chuan, & Kim, 2011; Mansourinia, Emamgholipour, Rekabdarkolaei, & Hozoori, 2013) also report a positive association between board size and firm payouts. Consequently, it is predicted that dividend payment is positively influenced by board size. Board independence is calculated by the ratio of the number of independent directors and board size. Abor and Fiador (2013) document that independent directors have a negative impact on dividend payment. Similarly, Al-Najjar and Hussainey (2009) state that dividends are adversely related to the representation of independent directors on boards of 400 firms in the United Kingdom. Therefore, it is expected to have an adverse association between independent directors and corporate dividend payouts. We further add two ownership variables into the models, which comprise of *institutional* ownership (i.e., the percentage of a firm stock held by institutional investors) and *insider* ownership (i.e., the percentage of a firm stock held by insiders) (Rozeff, 1982). Moreover, year dummies are used to capture for the year fixed effects. We use the function of robust standard errors to control for autocorrelation and heteroscedasticity. Table 1 reports definitions of all variables.

TABLE 1 Variable definitions

Variable	Definition
Dividend/net income	Cash dividend over net income
Dividend/TA	Cash dividend over total assets
Dividend yield	The yield of cash dividends
Propensity to pay	The propensity (likelihood) to pay cash dividends
Fraction of female directors	Board-level gender diversity, defined as the fraction of female directors on board
Number of female directors	Board-level gender diversity, defined as the number of female directors on board
Female chair	Dummy variable which takes a value of 1 if the chair is female and otherwise 0
Female CEO	Dummy variable which takes a value of 1 if the CEO is female and otherwise 0
Ln(board size)	The natural logarithm of total number of directors on board
Board independence	The ratio of the number of independent directors and board size (%)
Ln(M&A)	The number of mergers and acquisitions deals in the natural logarithm form
Institutional ownership	The percentage of institutional ownership
Insider ownership	The percentage of insider ownership
Ln(total assets)	The natural logarithm of total assets
Firm age	The natural logarithm of the firms' age that changes annually
Leverage	Total debt over total assets
Tobin's *q*	Total debt plus market capitalisation that is defined as the value of a firm on the stock market divided by total assets
ROA	Net income over total assets
Return volatility	The standard deviation of return on assets

Note: This table presents the definitions of all variables used in the regression models.

4 | SUMMARY STATISTICS

Table 2 depicts the summary statistics of all variables, which are included in the empirical models. For dependent ones, the proxy of the ratio of cash dividends over net income is used. It can be seen that the ranges of this variable is from 0 to 99.1%, with an average of 38.4% and standard deviation of 0.241. For the main interest independent variables, results show that the number of female directors serving on board, averagely, is two people. This accounts for 16.77% of the total directors of the whole board. The maximum number of female directors and their proportion are six directors and 50%. This implies a significant lower presence of those females in UK firms working for a board. Remarkably, some companies do not have females serving as a board member (min of 0). These two alternative measures of the board gender diversity (fraction of female directors and number of female directors) have low standard deviation of 0.104 and 1.15.

Table 3 presents the Pearson correlation between each pairs of explanatory variables included in the empirical models. As suggested by Kennedy (2003), the level at which multicollinearity phenomenon of two variables

TABLE 2 Summary statistics

Variables	*N*	Mean	p50	*SD*	Min	Max
Dividend/net income	700	0.384	0.392	0.241	0	0.991
Dividend/TA	700	0.029	0.023	0.027	0	0.244
Dividend yield	700	2.597	2.490	1.887	0	18.180
Ln(M&A)	625	1.791	1.791	0.922	0	5.252
Fraction of female directors	700	16.777	16.667	10.382	0	50
Number of female directors	700	1.813	1.999	1.150	0	6
Female chair	700	0.004	0	0.065	0	1
Female CEO	700	0.066	0	0.248	0	1
Ln(board size)	700	2.350	2.303	0.209	1.792	2.944
Board Independence	700	0.631	0.636	0.143	0	1.111
Institutional ownership	700	67.946	69.520	0.256	8.220	100
Insider ownership	700	1.183	0.030	0.0852	0	74.99
Ln(total assets)	700	16.059	15.910	1.301	12.880	19.441
Firm age	700	3.790	3.784	1.121	0	6.215
Leverage	700	0.250	0.238	0.145	0	0.724
Tobin's *q*	700	1.587	1.266	1.027	0.295	9.785
ROA	700	7.104	6.488	6.394	−24.306	63.081
Return volatility	700	3.999	3.069	3.405	0.278	36.048

Note: This table presents the descriptive statistics, including minimum, mean, maximum and *SD*, of all variables used in the research with 700 firm-year observations. Table 1 provides definitions of the variables in the model.

Abbreviations: M&A, mergers and acquisitions; ROA, return on assets; TA, total asset.

exists is around 0.80. This means that if the correlation of two explanatory variables is lower than 0.80, there is no remarkable relationship between these two factors. The table indicates that the correlation of all pairs of variables is weak or moderate (<0.80) indicating that multicollinearity phenomenon does not occur amongst independent variables. Therefore, these variables can be used in the same models.

5 | EMPIRICAL FINDINGS AND ANALYSIS

5.1 | Board gender diversity and dividend payouts levels: The effect of merger deals

Table 4 (Panels A and B) presents the ordinary least square (OLS) regression results where the dependent variable is the decisions for dividend payment calculated by dividends over net income (Dividend/Net Income). Whilst Panel A reports findings when using the number of female directors as a proxy for board gender diversity, Panel B provides results for the fraction of female directors (%) as an alternative measure.

In Panel A, the four regressions from Regressions 1 to 4 vary depending on different gender variables that are added. This study starts the multivariate analysis by regressing the dividend decision variable on the number of female directors serving on the board of directors, and its interaction with M&A (Regression 1). In addition to the Regression 1, Regressions 2–4 consist of different gender variables and interactions. Specifically, Regression 2 includes Female Chair and Female CEO; Regression 3 adds the interaction between Female Chair and M&A; Regression 4 includes full set of gender variables (i.e., board gender diversity, Female Chair, and Female CEO) and their interactions with M&A variable.

Across all these regressions, we find that the coefficients of the BGD on dividend levels are statistically and significantly positive at 1% level of significance. This finding implies a robustly positive linkage between board gender diversity and dividends. This means, when the number of female directors increases, cash dividend payment increases. The result supports for the hypothesis set in this study that female directors have greater tendency to impose high dividends as a monitoring device than male directors. This is also in line with the findings of previous studies such as Chen et al. (2017) and as expected, the findings are in opposition with those of

TABLE 3 Pearson correlation matrix amongst independent variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
1. Ln(M&A)	1														
2. Fraction of female directors	0.0803*	1													
3. Number of female directors	0.1414*	0.9297*	1												
4. Female chair	0.0634	0.0493	0.0488	1											
5. Female CEO	−0.0794*	0.2307*	0.1729*	−0.0174	1										
6. Ln(board size)	0.2004*	0.0582	0.3546*	0.0031	−0.0238	1									
7. Board independence	0.1084*	0.1970*	0.1612*	0.0822*	0.0189	−0.0252	1								
8. Institutional ownership	0.0405	−0.1178*	−0.1383*	0.0822*	−0.1791*	−0.0621	−0.0703	1							
9. Insider ownership	−0.1499*	−0.1163*	−0.1090*	−0.0091	0.0037	0.0251	−0.0984*	−0.2925*	1						
10. Ln(total assets)	0.3368*	0.1568*	0.3206*	0.0309	−0.0061	0.5306*	0.3025*	−0.0711	−0.1525*	1					
11. Firm age	−0.0402	0.1282*	0.0952*	−0.0248	0.2010*	−0.0901*	0.0474	−0.0466	−0.2688*	0.0778*	1				
12. Leverage	−0.0074	0.1887*	0.2196*	−0.0373	0.0043	0.0811*	0.0157	−0.1608*	−0.1340*	0.1266*	−0.0920*	1			
13. Tobin's *q*	−0.1229*	0.0456	0.009	0.0465	−0.0139	−0.0902*	−0.0738	−0.0668	0.2952*	−0.4428*	−0.1383*	−0.0932*	1		
14. ROA	−0.0852*	−0.0328	−0.0377	0.0354	0.0184	−0.0186	−0.0705	−0.1293*	0.1654*	−0.2436*	−0.0297	−0.1710*	0.5382*	1	
15. Return volatility	0.1131*	−0.0849*	−0.0549	0.0664	0.1185*	0.1557*	0.0935*	−0.0885*	0.2235*	0.0544	−0.0448	−0.2601*	0.1064*	0.1678*	1

Note: This table illustrates Pearson correlation amongst each pair of independent variables. All coefficients fall within the accepted limits for multicollinearity, showing no matter of this problem.

Abbreviations: M&A, mergers and acquisitions; ROA, return on assets.

*5% significance level.

TABLE 4 Ordinary least square regression results—the impact of board gender diversity, female Chair and female CEO on dividend payout levels: the effect of M&A deals

	Panel A—BGD: number of female directors				Panel B—BGD: fraction of female directors			
Dependent variable:	Dividend/net income				Dividend/net income			
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
BGD	0.070***	0.071***	0.071***	0.067***	0.007***	0.007***	0.007***	0.007***
	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.001)
Ln(M&A)	0.015	0.016	0.016	0.017	0.006	0.007	0.008	0.006
	(.434)	(.414)	(.400)	(.383)	(.748)	(.722)	(.708)	(.757)
BGD*ln(M&A)	−0.013*	−0.013*	−0.013*	−0.011*	−0.001**	−0.001***	−0.001***	−0.001***
	(.097)	(.094)	(.092)	(.094)	(.024)	(.006)	(.005)	(.004)
Female chair		0.195***	0.425**	0.428**		0.188***	0.448**	0.455**
		(.004)	(.028)	(.027)		(.007)	(.020)	(.019)
Female chair*ln(M&A)			−0.235***	−0.238***			−0.242***	−0.246***
			(.003)	(.003)			(.002)	(.002)
Female CEO		−0.009**	−0.009**	−0.076*		−0.023**	−0.022**	−0.062*
		(.035)	(.043)	(.063)		(.019)	(.026)	(.072)
Female CEO*ln(M&A)				0.055***				0.054**
				(.002)				(.022)
Ln(board size)	−0.090	−0.092	−0.093	−0.088	−0.020	−0.022	−0.023	−0.017
	(.149)	(.142)	(.138)	(.166)	(.734)	(.711)	(.692)	(.776)
Board independence	−0.142**	−0.138**	−0.139**	−0.136**	−0.150**	−0.147**	−0.148**	−0.144**
	(.022)	(.027)	(.026)	(.030)	(.015)	(.017)	(.017)	(.021)
Institutional ownership	−0.005	−0.000	−0.001	0.002	−0.008	−0.005	−0.006	−0.003
	(.898)	(.992)	(.983)	(.950)	(.841)	(.893)	(.884)	(.934)
Insider ownership	0.294**	0.294**	0.292**	0.298**	0.288**	0.290**	0.288**	0.290**
	(.022)	(.022)	(.023)	(.021)	(.028)	(.026)	(.027)	(.027)
Ln(total assets)	0.024**	0.024**	0.024**	0.023**	0.025**	0.025**	0.025**	0.023**
	(.020)	(.019)	(.019)	(.030)	(.015)	(.015)	(.014)	(.023)
Firm age	0.006	0.006	0.006	0.007	0.005	0.006	0.006	0.007
	(.501)	(.503)	(.507)	(.447)	(.547)	(.511)	(.515)	(.459)
Leverage	0.191***	0.189***	0.186***	0.182***	0.192***	0.190***	0.187***	0.183***
	(.004)	(.004)	(.005)	(.006)	(.003)	(.004)	(.004)	(.005)
Tobin's *q*	0.011	0.011	0.011	0.011	0.010	0.011	0.011	0.010
	(.309)	(.287)	(.279)	(.326)	(.328)	(.319)	(.311)	(.354)
ROA	0.004***	0.004***	0.004***	0.004***	0.004***	0.004***	0.004***	0.004***
	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)
Return volatility	−0.014***	−0.014***	−0.014***	−0.013***	−0.014***	−0.014***	−0.014***	−0.014***
	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.115	0.108	0.110	0.118	−0.037	−0.043	−0.040	−0.032
	(.469)	(.495)	(.490)	(.454)	(.803)	(.768)	(.785)	(.827)
Observations	625	625	625	625	625	625	625	625

TABLE 4 (Continued)

Dependent variable:	Panel A—BGD: number of female directors				Panel B—BGD: fraction of female directors			
	Dividend/net income				Dividend/net income			
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
R-squared	.166	.169	.170	.173	.171	.175	.176	.178
Wald Chi^2	7.75***	7.94***	9.61***	9.42***	8.25***	8.45***	9.97***	9.73***

Note: This table reports the findings of the ordinary least square regression for the impact of board gender diversity at board level and individual level on dividend payment and how this impact is affected by the existence of mergers and acquisitions deals. Dividends divided by net income is the dependent variable. The independent variables consist of the following. The number of female directors on board and the fraction of female directors are the alternative measures of BGD, defined as the number of female directors on board, and the number of female directors divided by the number of directors on boards, respectively. Female Chair (CEO) is measured by the dummy variable taking value of 1 if the Chair (CEO) is female and 0 otherwise. Ln(M&A) is the logarithm of the number of M&A deals during the accounting year. Board size is the total number of directors on boards, and Ln(board size) is computed as natural logarithm of board size. Board independence is measured as the number of independent directors divided by board size. Institutional ownership and insider ownership are estimated by the percentage of institutional ownership and insider ownership, respectively. Ln(total assets) is the proxy for firm size, computed as natural logarithm of total assets. Leverage is defined as total debt divided by total assets. Firm age is computed as natural logarithm of the age of each firm between 2006 and 2016. Tobin's *q* is measure by total debt plus market capitalisation divided by total assets. ROA is computed by net income over total assets. Return volatility is defined as the volatility of ROA. Year-fixed effects are included in the regression. The statistical significance is based on autocorrelation and heteroscedasticity robust firm-clustered standard errors. Robust *p* values are reported in parentheses.

Abbreviations: BGD, boardroom gender diversity; M&A, mergers and acquisitions; ROA, return on assets.

***$p < 1\%$; **$p < 5\%$; *$p < 10\%$.

Elmagrhi et al. (2017). This implies that the associations between board gender diversity and dividend pay-outs are based on whether the firms remain their exposures to profitable investment opportunities. In the research contexts of Elmagrhi et al. (2017) and Saeed and Sameer (2017), it is optimal for firms to capture those lucrative investment opportunities. Therefore, firms with high female representation tend to rationally capture this event and hence utilize the internal sources for expansion rather than dividend pay-outs. In our research, on the other hand, large UK firms expose to less profitable investments. As a result, female-led firms would instead distribute free cash-flow to the shareholders. This action can effectively reduce the agency conflicts within the organizations. According to agency theory and prior empirical literature (e.g., Byoun et al., 2016; Chen et al., 2017), female directors can bring several benefits to the boardroom and improve corporate governance quality. Additionally, the outcome hypothesis suggests that companies with good corporate governance are more likely to pay high dividends. Therefore, the finding of this research is consistent with the theory, hypothesis and literature about board gender diversity and dividend pay-outs. In term of economic significance, the coefficient of Regression 4 recommends that an increase of 10% points in the number of female directors on board is related to 0.067% points increase in the firm's cash dividend payout. However, this result (for FTSE100 companies) is smaller than the result of Chen et al. (2017) which was conducted for S&P 1500 firms.

Interestingly, we further find a significantly negative sign of the interaction term between BGD and M&A variables (i.e., BGD*ln(M&A)). This suggests that higher number of M&A deals tends to reduce positive effect of gender diversity on dividend payouts. We argue that free cash flow level of larger companies is likely to be greater than that of their smaller counterparts, leading to firm choices in using the available internal resources like cash for paying dividend to shareholders or M&A financing. M&A per se and financing decision for M&A deals are usually related to intense boardroom discussion amongst directors and requires ultimate approval from corporate senior layer (Levi et al., 2014). On a board having higher proportion of female directors, it can be argued that the M&A financing decisions might reflect feminine features due to profoundly indispensable role of these female directors. With the greater risk aversion level, higher board gender diversity is, therefore, more likely to associate with cash financing decisions as this is the least risky option compared to other outside resources (debt and equity) which is in line with Pecking Order Theory of Donaldson (1961). As a result, the cash resource availability will be deducted for dividend payouts. Therefore, higher number of M&A deals is found to play a negative moderating role on the positive association between board gender diversity and payout levels.

In order to ensure that the findings are not limited to the chosen measure of the independent variable (BGD), in Panel B, we retested all the Regressions 1–4 by replacing the number of female directors by the fraction

(percentage) of female directors serving on the board of directors, to investigate its effect on dividend payment. As reported in Regressions 5–8 respectively, results are found to be consistent across all models indicating robustness of our findings. That is, the number of female directors serving on board is evidenced to have a positive impact on dividend levels. However, such effect is weaker when the firm experienced more number of M&A deals.

Moving to the control variables in the regressions from (1) to (8), the results show that ROA has a significant and positive impact on the dividend payment, which implies that more profitable firms tend to pay higher dividends. Meanwhile, return volatility has a considerably negative influence on dividend payouts, indicating that higher return volatility can impose some constraints on dividend distribution. Both findings are in line with the results of Chen et al. (2017). In addition, leverage has a positive influence on dividend payouts. This positive link between leverage and dividend payout ratio is consistent with the finding of Chang and Rhee (1990) who suggest that high dividend payment is considered as a signal of financial situation, which allows companies to borrow money at a good rate. Therefore, companies with more debt financing tend to impose higher dividends, indicating a positive association between leverage and dividend payment (Chang & Rhee, 1990). In terms of factors related to board characteristics, board size has no significant effect on the dividend distribution whilst the relationship between board independence and dividend payment is negative. The negative link of board independence and dividend payouts is in the same vein with the finding of McGuinness, Lam, and Vieito (2015). It is argued that firms tend to encourage independent directors to disclose their opinions on company issues, and it is found that the independent directors' disclosed opposition to management policies reduces the propensity to pay dividends (Tang, Du, & Hou, 2013). Therefore, the presence of independent directors is considered as a brake against dividend distribution (McGuinness et al., 2015).

5.2 | Senior female directors and dividend payouts levels: The effect of merger deals

Prior literature (e.g., Parrotta & Smith, 2013; Peni, 2012; Strom, D'Espallier, & Mersland, 2014; Trinh et al., 2018) shows extremely limited findings for the influence of female Chairmen and CEOs on their firm's performance. This study, therefore, tests for the effects of these directors' positions (i.e., Chair and CEO) on the nexus between payouts and gender diversity.

Table 4 (Regressions 4 and 8) indicates an opposing result on payout levels between female Chairman and female CEO. That is, a female Chairman is positively related to levels of dividends whilst a female CEO shows its adverse influences on the payout. This can be explained because although female CEOs are likely to perform better than their male counterparts, CEOs could be monitored more intensively by the board of directors (Adams & Ferreira, 2007; Strom et al., 2014). They, thus, may be reluctant to share information, which leads to ineffective communication between them and other directors, and in turn, makes a higher agency problem. In addition, higher risk-averse features of a female CEO may lead to the rejection of profitable projects and thus fail to maximize the value of shareholders. This should not be the case for the female Chairman, who possesses stronger power and responsibilities towards board scrutiny and board decision making. She is likely to be more cautious and effective in providing her monitoring and advisory services to the management team. This reduces agency conflicts between investors/shareholders and managers (Parrotta & Smith, 2013; Peni, 2012; Trinh et al., 2018). As a result, the female directors' positions will have an impact on their performance of financial/payouts strategies when a female Chair is more likely to reduce the agency conflicts within firms, and in turn, that is related to higher levels of dividend payouts, relative to female CEO.

However, the interaction term between female Chair and M&A deals (i.e., Female Chair*ln(M&A)) shows a significantly negative sign which is opposite to the sign of coefficient on Female Chair (+). This implies that a higher number of M&A transactions have reduced the positive effect of a female Chair on dividend payments found in discussions above. In contrast, interestingly, we find the opposite results for the case of a female CEO. That is, more M&A deals have reduced the negative effect of a female CEO on levels of payouts. The rationale behind these findings can be driven by differential roles, power and personal interests between Chairman and CEO. For the female Chairman, her power is substantial in boardroom decisions in both M&A financing decisions and dividend policy. And her agency conflicts with the board is lower as she plays a monitoring role on management rather than participating in daily operations like a CEO. Thus, the risk-aversion hypothesis of a female Chairman is more intensified when deciding M&A financing channels and paying dividends to shareholders. However, this may not be the case for a female CEO because her risk aversion feature is also related to decisions and operations on a daily basis, typically investments. In addition, relative to a female Chairman, the female CEO is more likely to have severe agency conflicts with the board and shareholders as she may have her self-interests and hence, behave at the expenses of those stakeholders. These arguments initially explain the

TABLE 5 Sensitivity tests—board gender composition and dividend payout policy, using alternative measure for dividend payouts

	Panel A—BGD: number of female directors			Panel B—BGD: fraction of female directors		
Variables	(1) Dividend/TA	(2) Dividend yield	(3) Propensity to pay	(4) Dividend/TA	(5) Dividend yield	(6) Propensity to pay
BGD	0.004***	0.249***	0.304*	0.001***	0.012**	0.036**
	(.002)	(.010)	(.061)	(.001)	(.049)	(.034)
Ln(M&A)	0.001	0.011	—	0.001	0.146	—
	(.678)	(.948)		(.687)	(.376)	
BGD*ln(M&A)	−0.001**	−0.016*	—	−0.001**	−0.010**	—
	(.041)	(.081)		(.039)	(.014)	
Female chair	0.067***	7.840***	—	0.069***	7.549***	—
	(.004)	(.000)		(.003)	(.000)	
Female chair*ln(M&A)	−0.036***	−2.258***	—	−0.037***	−2.149***	—
	(.000)	(.001)		(.000)	(.003)	
Female CEO	−0.008*	−0.054	—	−0.010*	0.116	—
	(.068)	(.861)		(.095)	(.725)	
Female CEO*ln(M&A)	0.001*	0.060	—	0.001*	−0.114	—
	(.080)	(.770)		(.097)	(.595)	
Ln(board size)	−0.007*	−0.817*	−0.710	−0.002	−0.373	−0.349
	(.072)	(.076)	(.487)	(.579)	(.407)	(.720)
Board independence	−0.005***	−0.510	−0.555	−0.006***	−0.505	−0.686
	(.370)	(.359)	(.698)	(.273)	(.354)	(.635)
Institutional ownership	−0.010	−0.272	0.813	−0.010	−0.329	0.827
	(.002)	(.328)	(.236)	(.002)	(.236)	(.227)
Insider ownership	0.022	2.975**	5.709***	0.022	2.784**	5.767***
	(.281)	(.011)	(.000)	(.269)	(.020)	(.000)
Ln(total assets)	0.003***	0.487***	0.518***	0.003***	0.494***	0.544***
	(.000)	(.000)	(.005)	(.000)	(.000)	(.003)
Firm age	0.001	0.029	0.349	0.001	0.028	0.344
	(.647)	(.636)	(.013)	(.650)	(.648)	(.014)
Leverage	0.011*	1.978***	2.649**	0.011*	1.968***	2.665**
	(.060)	(.000)	(.038)	(.059)	(.000)	(.036)
Tobin's *q*	0.007***	0.402***	0.875**	0.007***	0.402***	0.906**
	(.000)	(.000)	(.023)	(.000)	(.000)	(.017)
ROA	0.002***	0.046***	0.202***	0.002***	0.045***	0.203***
	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)
Return volatility	−0.001	−0.057**	−0.380***	−0.001	−0.060**	−0.383***
	(.141)	(.030)	(.000)	(.139)	(.024)	(.000)
Year dummies	YES	YES	YES	YES	YES	YES
Constant	−0.017	−3.517***	−7.680***	−0.029**	−4.358***	−8.926***
	(.178)	(.002)	(.004)	(.014)	(.000)	(.001)
OLS method	Yes	Yes	No	Yes	Yes	No
Logit method	No	No	Yes	No	No	Yes
Observations	625	625	700	625	700	700
R^2	.560	.294	—	.564	.297	—

(Continues)

TABLE 5 (Continued)

	Panel A—BGD: number of female directors			Panel B—BGD: fraction of female directors		
Variables	(1) Dividend/TA	(2) Dividend yield	(3) Propensity to pay	(4) Dividend/TA	(5) Dividend yield	(6) Propensity to pay
Wald Chi^2	13.87***	14.63***	128***	14.15***	14.59***	126***
Pseudo R^2	—	—	.413	—	—	.415

Note: This table gives the sensitivity results of the OLS regression (Regressions 1–2 and 4–5) and Logit model (Regressions 3 and 6) for the impact of board gender diversity at board level and individual level on dividend payment. The alternative proxies for dividend payouts include dividends over total assets, dividend yield and propensity to pay dividend. The independent variables consist of the following: the number of female directors on board, the fraction of female directors are the alternative measures of BGD, defined as the number of female directors on board, and the number of female directors divided by the number of directors on boards, respectively. Female Chair (CEO) is measured by the dummy variable taking value of 1 if the Chair (CEO) is female and 0 otherwise. Ln(M&A) is the logarithm of the number of M&A deals during the accounting year. Board size is the total number of directors on boards, and Ln(board size) is computed as natural logarithm of board size. Board independence is measured as the number of independent directors divided by board size. Institutional ownership and insider ownership are estimated by the percentage of institutional ownership and insider ownership, respectively. Ln(total assets) is the proxy for firm size, computed as natural logarithm of total assets. Leverage is defined as total debt divided by total assets. Firm age is computed as natural logarithm of the age of each firm between 2006 and 2016. Tobin's q is measure by total debt plus market capitalisation divided by total assets. ROA, is computed by net income over total assets. Return volatility is defined as the volatility of ROA. Year-fixed effects are included in the regression. The statistical significance is based on autocorrelation and heteroscedasticity robust firm-clustered standard errors. Robust p values are reported in parentheses.

Abbreviations: BGD, boardroom gender diversity; M&A, mergers and acquisitions; OLS, ordinary least square; ROA, return on assets.

***$p < 1\%$; **$p < 5\%$; *$p < 10\%$.

likelihood for a female CEO to pay lower dividends so she can retain more free cash flow for her self-purposes. Furthermore, compared to male directors, they are still risk-averse; therefore, retaining more cash instead of paying dividends enables her to mitigate the overall risk and protect her reputation. When the number of M&A deals increases, a female CEO will be controlled more intensively by the board of directors. In this regard, she may be forced to pay higher dividends to shareholders under the tight scrutiny and deeper involvement of the whole board in discussing important decisions. Another possible reason is that the board of directors may put greater pressure on a female CEO for raising funds from outside sources to finance M&A deals. Thus, to make raising external funds easier, the female CEO has an incentive to pay out more dividends as an effective strategy to increase firm value and public confidence about the firm's current financial health, in line with signalling theory.

6 | SENSITIVITIES AND ROBUSTNESS TESTS

6.1 | Using alternative proxies for the dividend payout policy

We first check if the effects of female leadership at board- and individual-level on dividend policy, as well as the moderating role of M&A deals on such relationship, alter when using different measures for the dividend payment. To do so, we replaced the dividend over net income by other three alternative proxies including dividends over total assets, dividend yield and the propensity (likelihood) to pay cash dividends (*see* Chen et al., 2017).[2] Table 5 (Panel A) reports results when we employ the number of female directors as a measure for board gender diversity. Panel B presents findings for the board gender diversity proxied by the fraction of female directors. Specifically, we report the results of those tests with three alternative dependent variables which are dividends over total assets in Regressions 1 and 4, dividend yield in Regressions 2 and 5 and the propensity to pay dividends in Regressions 3 and 6. All alternative tests reveal similar results, which are accordance with the main findings. Results for controls are relatively unchanged. Note that a logit regression model is built to test for Regressions 3 and 6 because the dependent variable is a dummy variable which takes value of 1 if the firm pays cash dividends to shareholders and 0 otherwise.

6.2 | Excluding observations with female CEO

We next exclude observations with female CEO because the monitoring hypothesis is unlikely to apply to female insider directors as argued in the study of Chen et al. (2017). In Table 6, we report the consistent results to Table 4 indicating that boards with more female

TABLE 6 Sensitivity test—excluded observations with female CEO

	Panel A—BGD: number of female directors		Panel B—BGD: fraction of female directors	
Dependent variable	**Dividend/net income**		**Dividend/net income**	
Variables	(1)	(2)	(3)	(4)
BGD	0.063***	0.063***	0.006***	0.006***
	(.000)	(.000)	(.002)	(.002)
Ln(M&A)	0.019	0.020	0.009	0.010
	(.331)	(.300)	(.658)	(.633)
BGD*ln(M&A)	−0.012*	−0.012*	−0.001**	−0.001**
	(.082)	(.092)	(.044)	(.046)
Female chair	—	0.527***	—	0.544***
		(.007)		(.006)
Female chair*ln(M&A)	—	−0.276***	—	−0.281***
		(.001)		(.001)
Constant	0.117	0.109	−0.003	−0.009
	(.453)	(.484)	(.982)	(.950)
Control included	YES	YES	YES	YES
Year dummies	YES	YES	YES	YES
Observations	581	581	581	581
R-squared	.183	.188	.188	.193
Wald Chi^2	7.34***	9.30***	7.83***	9.53***

Note: This table reports the sensitivity results of the ordinary least square; regression for the impact of board gender diversity at board level and individual level on dividend payment for a sample excluding observations with female CEO. Dividend over net income is the dependent variable. A same set of independent variables used in Table 4 are included. Year-fixed effects are included in the regression. The statistical significance is based on autocorrelation and heteroscedasticity robust firm-clustered standard errors. Robust *p* values are reported in parentheses.
Abbreviations: BGD, boardroom gender diversity; M&A, mergers and acquisitions.
***$p < 1\%$; **$p < 5\%$; *$p < 10\%$.

members are likely to pay higher dividends. This finding is consistent with the hypothesis predicting a positive effect of board gender composition on dividend distribution. It also provides support for the outcome hypothesis suggesting that good corporate governance contributes to larger dividends paid. According to prior literature, gender-diverse boards are more effective than homogeneous boards in disciplining management through its effect on dividend policy. Moreover, the presence of female members on corporate boards can enhance the monitoring function of boards and improve governance quality, leading to the higher level of dividend payment. The findings also show that M&A deals tend to weaken the positive effect of board gender diversity on payout policy.

6.3 | Random-effect generalized least squares regression

In this section, we provide the result of a robustness check by using random-effect generalized least squares (GLS) regression. This method is expected to give more reliable and powerful results since it can overcome the limitations of OLS and fixed-effect regressions. Additionally, to resolve the autocorrelation and heteroscedasticity problems, the robust standard errors technique is employed. Table 7 (Regressions 1 and 3) shows a consistent result compared to the main regressions. Specifically, the estimated coefficient of female directors on board shows a positive sign and is statistically significant at the 1% level. This implies that dividend payment increases with the proportion of female directors on board. Furthermore, findings for female Chair and female CEO, and their interactions with M&A deals are also relatively unchanged.

6.4 | Endogeneity and two-step system generalized method of moments

Two-step system generalized method of moments (GMM) (Blundell & Bond, 1998) can solve the dynamic endogeneity of the board, which refers to previous realizations

TABLE 7 Robustness check—random-effect GLS and two-step system GMM

	Panel A—BGD: number of female directors		Panel B—BGD: fraction of female directors	
Dependent variable	**Dividend/net income**		**Dividend/net income**	
Variables	(1)	(2)	(3)	(4)
Dividend/NI_{t-1}	—	0.198**	—	0.229**
		(.046)		(.016)
BGD	0.058**	0.07***	0.006**	0.007**
	(.011)	(.008)	(.029)	(.024)
Ln(M&A)	0.009	0.023	−0.001	0.020
	(.681)	(.419)	(.953)	(.478)
BGD*ln(M&A)	−0.008*	−0.016***	−0.001*	−0.001**
	(.091)	(.009)	(.083)	(.035)
Female chair	0.523***	1.952**	0.552***	0.520**
	(.005)	(.028)	(.002)	(.049)
Female chair*ln(M&A)	−0.245***	−0.761**	−0.255***	−0.124*
	(.001)	(.032)	(.000)	(.096)
Female CEO	−0.056*	−0.236**	−0.048**	−0.074**
	(.077)	(.017)	(.043)	(.049)
Female CEO*ln(M&A)	0.046**	0.020*	0.048**	0.025*
	(.017)	(.082)	(.034)	(.063)
Constant	0.048	0.014	−0.086	0.033
	(.814)	(.793)	(.663)	(.961)
Control included	YES	YES	YES	YES
Random-effect GLS	YES	NO	YES	NO
GMM	NO	YES	NO	YES
Year dummies	YES	YES	YES	YES
Observations	625	550	625	550
AR(1) (*p* value)	—	.004	—	.001
AR(2) (*p* value)	—	.811	—	993
Hansen test for over-identification (*p* value)	—	.136	—	.196

Note: This table presents the sensitivity results of the random-effect GLS regressions and GMM for the impact of board gender diversity board level and individual level on dividend payment. Dividend over net income is the dependent variable. A same set of independent variables used in Table 4 are included. Running the GMM estimations, all results remain unchanged relative to main results in Table 4. Both, AR(1) and AR(2), are tests for first-order and second-order autocorrelation. The Hansen test of over-identification is based on the null hypothesis that all instrumental variables are valid. All results for these tests suggest a satisfaction of models' diagnostics which might produce reliable findings. Year-fixed effects are included in the regression. The statistical significance is based on autocorrelation and heteroscedasticity robust firm-clustered standard errors. Robust *p* values are reported in parentheses.

Abbreviations: BGD, boardroom gender diversity; GLS, generalized least squares; GMM, generalized method of moments; M&A, mergers and acquisitions.

***$p < 1\%$; **$p < 5\%$; *$p < 10\%$.

of the dependent factor affecting current levels of some or all of the independent factors (Wintoki, Linck, & Netter, 2012). Indeed, whilst past board structure can be correlated with current firm dividend payouts, current board structure may also be a result of past firm payouts. Particularly, higher dividend payment in the past could cause a substantial change in board members (e.g., replacing male directors by female directors). To partially address this issue, we followed the design of firm governance literature (e.g., Elnahass, Omoteso, Salama, & Trinh, 2019; Pathan, 2009; Trinh, Elnahass, Salama, & Izzeldin, 2019), to utilize the GMM. Table 7 (Regressions 2 and 4) reveals

that GMM results are accordance with the main results obtained from OLS approach, implying that our results are not driven by omitted variable bias, heterogeneity and/or dynamic endogeneity issues.

6.5 | Lagged independent variables by 1 or 2 years

An alternative approach for endogeneity treatment is to lag independent variables by 1 or 2 years in traditional OLS regression models. In other words, we rerun Regressions 4 and 8 in Table 4 by employing past values of explanatory variables. This technique can be useful in reducing potential endogeneity issues of most of variables, which exist in our regressions. Table 8 shows that main results found in Table 4 are qualitatively unchanged. Specifically, board gender diversity variable is positively associated with levels of dividend payments. This finding is negatively affected by the higher number of M&A deals during the estimated period. In addition, there is an opposing effect on dividend policy between female Chair and female CEO. Thus, we believe that our results are robust to endogeneity issues.

TABLE 8 Robustness check—lagged independent variables by 1 or 2 years

	Panel A—BGD: number of female directors		Panel B—BGD: fraction of female directors	
Dependent variable	**Dividend/net income**		**Dividend/net income**	
Variables	(1)	(2)	(3)	(4)
BGD	0.076***	0.089***	0.007***	0.009***
	(.000)	(.000)	(.004)	(.000)
Ln(M&A)	0.039**	0.069***	0.029	0.071***
	(.041)	(.001)	(.171)	(.002)
BGD*ln(M&A)	−0.017**	−0.027***	−0.001**	−0.003***
	(.045)	(.003)	(.025)	(.009)
Female chair	0.812***	0.837***	0.781***	0.803***
	(.000)	(.000)	(.000)	(.000)
Female chair*ln(M&A)	−0.381***	−0.400***	−0.370***	−0.386***
	(.000)	(.000)	(.000)	(.000)
Female CEO	−0.124*	−0.141**	−0.117**	−0.136*
	(.073)	(.039)	(.021)	(.69)
Female CEO*ln(M&A)	0.079*	0.096**	0.075*	0.091**
	(.077)	(.032)	(.710)	(.049)
Constant	0.259	0.279	0.129	0.182
	(.139)	(.145)	(.437)	(.315)
Control included	YES	YES	YES	YES
Lagged 1 years	YES	NO	YES	NO
Lagged 2 years	NO	YES	NO	YES
Year dummies	YES	YES	YES	YES
Observations	516	439	516	439
R squared	0.166	0.184	0.160	0.179
Wald Chi^2	9.35***	9.05***	10.11***	8.84***

Note: This table presents the sensitivity results of ordinary least square using lag values of independent variables for the impact of board gender diversity board level and individual level on dividend payment. Dividend over net income is the dependent variable. A same set of independent variables used in Table 4 are included but lagged by 1 or 2 years. Year-fixed effects are included in the regression. The statistical significance is based on autocorrelation and heteroscedasticity robust firm-clustered standard errors. Robust *p* values are reported in parentheses.

Abbreviations: BGD, boardroom gender diversity; M&A, mergers and acquisitions.

***$p < 1\%$; **$p < 5\%$; *$p < 10\%$.

6.6 | Propensity score matching approach

The propensity score matching (PSM) approach of Rosenbaum and Rubin (1983) is also employed in this study to solve the sample selection bias and possible endogeneity of corporate governance variables. The potential issue of endogeneity could be the causal association between corporate governance such as board gender diversity, and dividend payout levels. For instance, firms with lower dividend payment could have incentives to recruit female directors to manage their free cash flow, which may lead to some spurious inferences. Therefore, using a more reliable method to treat these problems could improve the reliability and robustness of our findings.

We followed Casu, Clare, Sarkisyan, and Thomas (2013), Trinh, Aljughaiman, and Cao (2020), and

TABLE 9 Propensity score matching technique: the effect of board gender diversity on dividend policy

Dependent variable: dividend payout levels						
Panel A: average treatment effects with nearest neighbour matching method						
		Treated (female)	Control	Δ	*SE*	*t* statistics
1:1 matching without replacement						
	Unmatched	0.417	0.341	0.076***	0.018	4.19
	Matched	0.412	0.341	0.071***	0.019	3.70
1:1 matching with replacement						
	Unmatched	0.417	0.341	0.076***	0.018	4.19
	Matched	0.416	0.393	0.023**	0.027	2.82
Nearest neighbour ($n = 2$)						
	Unmatched	0.417	0.341	0.076***	0.018	4.19
	Matched	0.416	0.383	0.034**	0.024	2.36
Nearest neighbour ($n = 3$)						
	Unmatched	0.417	0.341	0.076***	0.018	4.19
	Matched	0.416	0.380	0.036**	0.023	2.52
Panel B: Average treatment effect on the treated with 1:1 nearest neighbour matching and bootstrapping of standard errors						
	Number of obs.	Replications	Observed (Δ)	Bias	*SE*	*t* statistics
	703	100	0.030**	0.004	0.030	2.993
	703	1,000	0.030**	0.005	0.028	2.081
	703	10,000	0.030**	0.006	0.027	2.101
Panel C: Regressions on matched samples						
	(1)	(2)	(3)	(4)		
Independent variables	1:1 matching without replacement	1:1 matching with replacement	Nearest neighbour ($n = 2$)	Nearest neighbour (n = 3)		
BGD dummy	0.056*** (.0003)	0.022* (.074)	0.031* (.095)	0.035** (.050)		
Controls	Yes	Yes	Yes	Yes		
Constant	−0.052 (.762)	−0.034 (.830)	−0.085 (.624)	−0.140 (.399)		
Adjusted *R*-squared	.111	.118	.126	.124		
Observations	600	786	616	648		

Note: Estimator: propensity-score matching. Treatment model: probit. The table reports the propensity score matching approach of the average treatment effects (ATE) of and ATT estimation with nearest neighbour Matching method and bootstrapping of standard errors. The ATE and ATT of board gender diversity on the dividend policy (Δ) is estimated as the difference between the mean changes of firms having board with female directors (column 'Treated') and that of matched firms having board without female directors (column 'Nontreated'). *p* value is presented in parentheses. *t* statistics based on standard errors are presented in final column.

Abbreviations: BGD, boardroom gender diversity.

***$p < 1\%$; **$p < 5\%$; *$p < 10\%$.

Elnahass et al. (2019) and did the following three steps: (1) estimating propensity scores for firms with a board with female directors (treatment group) and firms having a board without female directors (control group). For this step, we use a probit regression of a dummy response taking the value of one for firms with a board with female directors and zero otherwise. (2) After getting the estimated propensity scores of each group (treatment and control), we proceed to match each observation of the treatment group with one observation from the control group. To do so, we use different techniques which include the one-to-one nearest neighbour matching with and without a replacement that the unit chosen from male directors' observations, and nearest neighbour matching with $n = 2$ and $n = 3$ with replacement. Appendix shows the quality of matching by using the distribution of the propensity score before and after matching. (3) Estimating an average board gender diversity effect by performing regressions on the matched samples.

Table 9 shows univariate test results for the average treatment effects (ATE – Panel A) and average treatment effects on the treated (ATT) estimation with bootstrapping of standard errors (i.e., 100, 1,000, and 10,000 replications) (Panel B). We find that the dividend level is higher for firms with a board with female directors than for firms with a board without female directors. This result is consistent when we use a different PSM technique. After employing bootstrapping of standard errors with different replications, we find the same result. In Table 9 (Panel C), we further report regression test results of board gender diversity (dummy) on dividend levels, which show positive coefficients across all Models 1–4. This suggests that the positive relationship between board gender diversity and dividend payout is robust when using PSM. In sum, our results, found in Table 4, are relatively strong even after treating for the issues of endogeneity and sample selection bias.

7 | CONCLUDING REMARKS

This study explores the relationship between board gender composition and cash dividend payment for a sample of industrial firms traded on the FTSE 100 during the period 2006–2016. The main theoretical framework of this study is the agency theory which focusses on the conflicts of goals between managers and shareholders as well as the information asymmetries in companies that allow managers to maximize their own benefits rather than acting in the shareholders' benefit. Board of directors plays a crucial role in reducing agency problems through their influences on organizational dividend decisions. As a result, researchers and practitioners have consistently attempted to research ways to improve the quality of the boards. Amongst many remedies, the incorporation of females within boards is a promising way that is claimed to enhance the effectiveness of boards in the decision-making process. Related studies on board gender diversity and dividend payouts show mixed results on the effect of gender-diverse boards on dividend payment with signs of both positive and negative effects.

Our findings provide evidence in favour of the outcome hypothesis, revealing that gender-diverse boards can enhance governance quality and thereby have a positive influence on dividend distribution. This supports the first hypothesis and is consistent with previous studies. The finding is still significant and robust with the use of different measures of dividend payouts and female board representation, as well as alternative model specifications. However, interestingly, when we employ the number of M&A deals as a moderating channel on the relationship between female leadership and dividend policy, we find that higher number of M&A deals tends to reduce the positive effect of gender diversity on dividend payouts. Additional analyses show opposing effects of a female Chairman and a female CEO on the dividend payouts strategies. Although the female Chair is positively associated with a level of payouts, the female CEO shows an adverse impact. However, the M&A deals have reduced these positive and negative effects of female Chair and female CEO, respectively.

Future research might include financial education or other characteristics of directors on boards such as qualification or age that can have effects on dividend policy. In addition, country-level characteristics such as disclosure requirement index and creditor rights index can be included in the research about the determinants of dividend payouts. Moreover, to explore the effect of board characteristics on dividend payment, further research can include different board characteristics such as CEO role duality and board meeting. Additionally, further studies can look at the effect of gender-diverse boards on payouts in three periods including before a financial crisis, during a financial crisis and after a financial crisis. Finally, future studies can investigate the relationship between female leadership and dividend payment in other developed countries to compare the results between the UK and other countries. Further studies can conduct research with a sample of developing countries to examine whether there are any differences in the findings of the relationship between female leadership and dividend payment between developed and developing countries.

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ENDNOTES

[1] Spencer Stuart Board Index in 2018 found that 50% of the S&P 500 companies have a combined Board Chair/CEO, in contrast with 0.7% (only 11 firms out of 150 firms) of FTSE 150.

[2] Unreported statistics indicate their means as 2.9 and 2.597% and low standard deviations as 0.027 and 1.887, respectively.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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APPENDIX A.

Distributions of propensity score before and after matching.